

WHAT IS CLAIMED IS:

1. An airflow distribution control system for usage in a raised-floor data center comprising:
an under-floor partition with a controllable flow resistance, the partition being capable of selective positioning in a plenum beneath the raised-floor; and
a sensor communicatively coupled to the partition that detects a parameter indicative of airflow distribution and controls the flow resistance based on the parameter.
2. The system according to Claim 1 further comprising:
a plurality of adjustable apertures in the under-floor partition; and
a servomotor coupled to the apertures and the sensor, the servomotor responsive to communication from the sensor to control flow resistance of the partition.
3. The system according to Claim 1 further comprising:
a plurality of louvered shutters in the under-floor partition; and
a servomotor coupled to the louvered shutters and the sensor, the servomotor responsive to communication from the sensor to control flow resistance of the partition.
4. The system according to Claim 1 further comprising:
a plurality of under-floor partitions with controllable flow resistances, the partitions being selectively positioned in the plenum and independently controllable by the sensor.
5. The system according to Claim 1 further comprising:
a plurality of under-floor partitions with controllable flow resistances, the partitions being selectively positioned in the plenum; and
a network of distributed sensors communicatively coupled to the plurality of under-floor partitions, the sensor network capable of controlling the plurality of partitions mutually independently.

6. The system according to Claim 5 wherein:
the plurality of under-floor partitions has adjustable apertures of varying sizes and densities.
7. The system according to Claim 1 wherein:
the sensor is selected from among a group consisting of airflow sensors, pressure sensors, and temperature sensors.
8. An airflow control apparatus for usage in a raised-floor data center comprising:
a partition configured for under-floor installation;
a plurality of adjustable apertures in the partition; and
a servomotor coupled to the apertures and capable of controlling flow resistance of the partition.
9. The apparatus according to Claim 8 further comprising:
a plurality of louvered shutters in the partition.
10. The apparatus according to Claim 8 further comprising:
a plurality of adjustable apertures of varying sizes and densities in the partition.
11. A ventilation system for a data center comprising:
a raised floor overlying a plenum space and further comprising a plurality of tiles;
at least one under-floor partition with a controllable flow resistance, the partitions being selectively positioned in the plenum beneath the raised-floor; and
at least one sensor communicatively coupled to the at least one partition, the at least one sensor that detect a parameter indicative of airflow distribution and control the flow resistance based on the parameter.
12. The system according to Claim 11 wherein:
the plurality of raised-floor tiles include solid tiles and perforated tiles selectively arranged to manage airflow.

13. The system according to Claim 11 further comprising:
at least one air conditioning unit arranged to inject cooling air into the plenum;
and
a plurality of under-floor partitions arranged in a series so that partitions with
higher flow resistance are positioned generally more proximal to the air
conditioning unit and partitions with lower flow resistance are positioned
generally more distal to the air conditioning unit.
14. The system according to Claim 11 further comprising:
a plurality of under-floor partitions arranged in a selected pattern wherein ones of
the partitions have flow resistance that is controllable independently of
other partitions.
15. The system according to Claim 11 further comprising:
a plurality of adjustable apertures in ones of the at least one under-floor partition;
and
a servomotor coupled to the apertures and the sensor, the servomotor being
responsive to communication from the sensor to control flow resistance.
16. The system according to Claim 11 further comprising:
a plurality of louvered shutters in ones of the at least one under-floor partition; and
a servomotor coupled to the louvered shutters and the sensor, the servomotor
responsive to communication from the sensor to control flow resistance.
17. The system according to Claim 11 further comprising:
a plurality of under-floor partitions with controllable flow resistances, the
partitions being selectively positioned in the plenum; and
a network of distributed sensors communicatively coupled to the plurality of
under-floor partitions, the sensor network capable of controlling the
plurality of partitions mutually independently.

18. The system according to Claim 11 wherein:
at least one under-floor partitions has adjustable apertures of varying sizes and densities.
19. The system according to Claim 11 wherein:
the sensor is selected from among a group consisting of airflow sensors, pressure sensors, and temperature sensors.
20. A method of controlling airflow distribution in a raised-floor data center comprising:
sensing a parameter indicative of airflow distribution; and
adjusting flow resistance distribution in a plenum under the raised floor based on the sensed parameter.
21. The method according to Claim 20 further comprising:
selectively distributing a plurality of partitions in the plenum, the partitions having a controllable flow resistance.
22. The method according to Claim 21 further comprising:
adjusting flow resistance among the plurality of partitions independently based on the sensed parameter.
23. The method according to Claim 21 further comprising:
selectively distributing at least one sensor in the data center;
determining a spatial distribution of the parameter indicative of airflow distribution based on signals from the at least one sensor; and
adjusting flow resistance among the plurality of partitions independently based on the parameter spatial distribution.
24. The method according to Claim 21 further comprising:
adjusting flow resistance among the plurality of under-floor partitions by adjusting apertures of varying sizes and densities.

25. An article of manufacture comprising:
a controller usable medium having a computable readable program code embodied therein for controlling airflow distribution in a raised-floor data center, the computable readable program code further comprising:
a code capable of causing the controller to sense a parameter indicative of airflow distribution; and
a code capable of causing the controller to adjust flow resistance distribution in a plenum under the raised floor based on the sensed parameter.
26. The article of manufacture according to Claim 25 further comprising:
a code capable of causing the controller to adjust flow resistance among the plurality of partitions independently based on the sensed parameter.
27. The article of manufacture according to Claim 25 further comprising:
a code capable of causing the controller to determine a spatial distribution of the parameter indicative of airflow distribution based on signals from the at least one sensor; and
a code capable of causing the controller to adjust flow resistance among the plurality of partitions independently based on the parameter spatial distribution.
28. An airflow control apparatus for usage in a raised-floor data center comprising:
means for sensing a parameter indicative of airflow distribution; and
means for adjusting flow resistance distribution in a plenum under the raised floor based on the sensed parameter.